2015 Updating and Screening Assessment for East Lothian Council

In fulfillment of Part IV of the
Environment Act 1995
Local Air Quality Management

October 2015

Local Authority Officer	Colin Clark
Department	Partnership & Services for Communities
Address	John Muir House HADDINGTON East Lothian EH41 3HA
Telephone	01620 827443
e-mail	cclark1@eastlothian.gov.uk
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Executive Summary

This report presents the results of the Updating and Screening Assessment of local air quality within East Lothian Council. The Updating and Screening Assessment represents the first step in the current round of the management of local air quality, as required by Part IV of the Environment Act, 1995.

The objective of the Updating and Screening Assessment is to provide a checklist approach to identify those matters that have changed since the previous round of review and assessment was completed in 2014, and which may now require further assessment.

The Updating and Screening Assessment report should identify where there is a risk of an air quality objective being exceeded at a location with relevant public exposure by use of simple screening assessments and other similar tools. Where a risk has been identified the local authority is required to undertake a Detailed Assessment to identify with reasonable certainty whether or not an exceedence will occur.

Following on from the 2013 Progress Report (Ref 20), passive monitoring of Nitrogen dioxide (NO_2) in Musselburgh indicated concentrations at various locations that continued to exceed, or were very close to, the Annual Mean Objective. Accordingly, in November 2013 an Air Quality Management Area (AQMA) was declared in Musselburgh (Ref 21) in relation to breaches and likely breaches of the Nitrogen Dioxide annual mean air quality objective. The extent of the AQMA is High Street, Musselburgh (A199) from its junction with Newbigging and extending westwards to the junction with Bridge Street and Mall Avenue.

In September 2014 East Lothian Council carried out a Further Assessment (Ref 22) to assess the present and future air quality within the existing AQMA and the reasons for this. The assessment provides the technical justification for the measures the authority later includes in any action plan. The Further Assessment was completed in September 2014.

The study has confirmed the findings of a previous Detailed Assessment (Ref 18), namely that there are exceedences of the annual mean NO_2 objective where relevant exposure exists. The contour plots and dispersion modelling prepared for this study, and monitoring results for 2014, indicate that the current AQMA boundary includes all relevant sources and does not require revocation or amendment at this time.

It is estimated that ambient NOx reductions in the AQMA of up to 27% at some locations are required in order to achieve compliance with the annual mean NO_2 objective.

The source apportionment exercise of NOx indicates that emissions from buses form the largest contribution to roadside NOx concentrations at all locations along the High St AQMA.

Modelling of the mitigation scenarios indicates that an integrated package of interventions would provide the best NOx reductions. Measures that reduce overall traffic, reduce queuing and reduce bus numbers, where appropriate, will reduce road NOx significantly. These measures are however very challenging (both financially and technically) to implement.

The 2015 Updating & Screening Assessment confirms that NO_2 emissions on Musselburgh High Street continue to exceed, or are very close to, the Annual Mean Air Quality Objective at some locations within the AQMA.

An Action Plan is currently being developed to identify what precise mitigation measures will be taken by the Council to ensure pollutant concentrations are brought back down to below Objective Levels. It is anticipated that the first draft of the Action Plan will be available for consultation with relevant Stakeholders early in 2016.

The next course of action for East Lothian Council in the Review and Assessment process is the submission of a Progress Report by April 2016.

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1 Introduction

1.1 Description of Local Authority Area

East Lothian is approximately 270 square miles in area and has 43 miles of coastline (photograph 1). Our boundaries extend from Musselburgh, immediately east of Edinburgh's suburban edge, eastwards to Dunbar and beyond to the Scottish Borders. From the coastline of the Firth of Forth, an agricultural plain extends southwards to the Lammermuir hills.

Photograph 1 – Yellowcraigs Beach

The population of East Lothian is circa 94,000. More than half the population live in its western sector, the main towns being Musselburgh (approximate population 22,000), Prestonpans (7,000), Tranent (9,000) and Cockenzie/Port Seton (5,500). The principal towns in the east are Haddington (9,000), North Berwick (6,000) and Dunbar (7,000). Although Musselburgh is the largest town, Haddington is the administrative centre for East Lothian Council.

The major sources of pollutants within the County are road traffic (photograph 2). The main potential industrial source is the Lafarge Cement Works, Dunbar (photograph 3) since Cockenzie Power Stations ceased production in 2013.

Photograph 2 – Buses on Musselburgh High Street

Photograph 3 – Lafarge Cement Works, Dunbar:

1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995) (Ref 1), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 (Ref 2) and the relevant Policy and Technical Guidance documents (Ref 3). The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in Scotland** are set out in the Air Quality (Scotland) Regulations 2000 (Scottish SI 2000 No 97) (Ref 4), the Air Quality (Scotland) Amendment Regulations 2002 (Scottish SI 2002 No 297) (Ref 5), and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre $\mu g/m^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in Scotland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu g/m^3$	Running annual mean	31.12.2003
	3.25 $\mu g/m^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 $\mu g/m^3$	Annual mean	31.12.2010
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

During the second round of review and assessment (Refs 6, 7 and 8), which was due to be completed by April 2005, Carbon Monoxide, Benzene, Lead and 1,3-Butadiene were identified as not being likely to exceed the relevant Air Quality Objectives. The third round of review and assessment (Refs 9, 10 and 11), which was due to be completed by April 2008, indicated that the relevant Air Quality Objectives for these pollutants continued to be met.

However, the second round of review and assessment (Refs 6, 7 and 8) did conclude that Nitrogen Dioxide and PM10 levels in Musselburgh, due to road traffic sources, and also Sulphur Dioxide levels in vicinity of Cockenzie Power Station, Cockenzie and Lafarge Cement Works, Dunbar would require to be subject of a Detailed Assessment. PM10 levels in vicinity of Cockenzie Power Station would also require Detailed Assessment.

The Detailed Assessment (Ref 7) and subsequent third round of review and assessment (Refs 9, 10 and 11) indicated that the relevant Air Quality Objectives for Nitrogen Dioxide levels in Musselburgh and throughout East Lothian continued to be met.

However, PM10 levels due to road traffic were forecast to exceed the annual mean objective for 2010 in Musselburgh, although these results were based on the application of correction factors and were obtained using Osiris light-scattering measurement equipment that has since been deemed as unsuitable for comparison against Objectives. The Osiris units were replaced with Tapered Element Oscillating Microbalance (TEOM) units in May 2005. The 2007 Progress Report (Ref 10) concluded, from results obtained using the TEOM unit, that the 24-hour mean Objective will be complied with.

Furthermore, the Annual Mean Objective was being complied with using the local correction factor of 1.14. However, the Annual Mean was exceeded when the National correction factor of 1.3 was applied. Correspondence from the Scottish Executive (Ref 12) advised that where the predicted levels are below the Objective using the local correction factor but above the Objective when the National correction factor is applied, the local authority should carryout monitoring using a gravimetric sampler. East Lothian Council, however, did not feel that this approach could be justified at that time, especially having regard to the results of the Department for Environment Food and Rural Affairs (DEFRA) equivalence study (Ref 13) which concluded that TEOM units not fitted with Filter Dynamics Measurement Systems (FDMS) failed to meet equivalence criteria and, as such, cannot be considered equivalent to the European Reference method. As a consequence, in March 2008 East Lothian Council replaced the TEOM unit with a Beta Attenuation Monitor (BAM) unit, the results of which can be compared directly to the Objective levels as the BAM units met the equivalence criteria outlined by DEFRA.

The 2005 Detailed Assessment (Ref 7), and subsequent Updating and Screening Assessment (Ref 9) of PM10 levels in Cockenzie due to activities undertaken within the coal storage plant for Cockenzie Power Station concluded that the relevant Air Quality Objectives would be met by the target year.

The 2005 Detailed Assessment (Ref 7) of Sulphur Dioxide levels in vicinity of Cockenzie Power Station, Cockenzie concluded that there would be no exceedences of any Objectives, although the 15-minute mean in the vicinity of Lafarge Cement Work's, Dunbar was forecast to exceed the Objective. However the installation of abatement equipment and the subsequent reduction in Sulphur Dioxide emissions has been taken into account in the third round of Review and Assessment (Refs 9, 10 and 11) that concluded the relevant Air Quality Objectives would be met.

The fourth Round of Review and Assessment was completed in 2011. As with previous rounds of review and assessment, this round was also based on a phased approach. The first step of this round was the 2009 Updating and Screening Assessment (USA) (Ref 14), which was due to be completed by April 2009 and was subsequently completed in November 2009.

If sufficient risk is identified, then the local authority must complete a Detailed Assessment to provide an accurate estimate of the likelihood of an air quality objective being exceeded at the particular location with relevant public exposure. The results of the USA in 2009 (Ref 14) concluded that a Detailed Assessment of PM10 and Nitrogen Dioxide levels in Musselburgh was required due to the Biomass Combustion Plant located at the Queen Margaret University. This Detailed Assessment (Ref 15) was completed in October 2010 and concluded that the biomass emissions will not result in any exceedence of the relevant Air Quality Objectives and that the process contributions are typically a small percentage of the overall Air Quality Objectives.

The Progress Report completed in 2010 (Ref 16) concluded that all Air Quality Objectives continued to be met within East Lothian.

Following completion of the Progress Report in 2011 (Ref 17) the results of automatic and passive monitoring of Nitrogen dioxide confirmed that both the annual and 1-hour objectives continued to be met. However, passive monitoring of Nitrogen dioxide in Musselburgh High Street indicated exceedences at 2 locations (tube numbers 6 and 7 in vicinity of 147 and 183 High Street respectively). Accordingly, a Detailed Assessment of NO2 at these locations was required.

The Detailed Assessment of Nitrogen dioxide in Musselburgh due to Road Traffic Sources (Ref 18) was completed in June 2012. It was concluded from the Detailed Assessment that the highest modelled annual average NO2 concentrations were predicted at receptors located on High Street and Bridge Street close to bus stops and that the majority of the predicted annual mean exceedences were marginal. An element of uncertainty was introduced to the computer model used in the Detailed Assessment as a result of estimating emissions from both queuing traffic and stationary buses. It was considered appropriate by East Lothian Council to carry out passive monitoring of NO2 at a representative sample of these exceeding receptor locations to confirm the results of the modelling assessment. This would greatly enhance the reliability of any Further Assessment and allow better delineation of any required AQMA boundary. As a result of the abovementioned conclusion East Lothian Council started monitoring NO2 concentrations at 5 new locations on 3rd May 2012; using passive diffusion tubes. These new monitoring sites are located at receptors R1 (167 High Street), R5 (137 High Street), R13 (69 High Street), R24 (86 High Street) and R47 (15 Bridge Street) where

dispersion modelling indicates that exceedences of the NO2 annual mean objective had occurred during 2011. It was also recommended following the detailed assessment of NO2 that East Lothian Council should consider the declaration of an AQMA for the NO2 annual mean objective after May 2013 if monitoring results obtained from new locations at R1 (167 High Street), R5 (137 High Street), R13 (69 High Street), R24 (86 High Street) and R47 (15 Bridge Street), in addition to existing monitoring locations, confirms the modelling results that the NO2 annual mean objective has been exceeded.

The fifth round of Review and Assessment commenced with the 2012 Updating and Screening Assessment (Ref 19), carried out for all pollutants and which indicated that current Air Quality Objectives are being complied with for the majority of pollutants. However, passive monitoring of Nitrogen dioxide in Musselburgh and the results of a Detailed Assessment of NO2 due to Road Traffic Sources in Musselburgh that was completed in June 2012 (Ref 18) continued to indicate concentrations at various locations that are close to the Annual Mean Objective.

It was considered appropriate by East Lothian Council to carry out passive monitoring of NO2 at a representative sample of these exceeding receptor locations to confirm the results of the modelling assessment. East Lothian Council started monitoring NO2 concentrations at 5 new locations on Musselburgh Bridge Street and High Street on 3rd May 2012; using passive diffusion tubes. It was decided at that time that East Lothian Council should consider the declaration of an AQMA for the NO2 annual mean objective after submission of the 2013 Progress Report (Ref 20) if monitoring results obtained from new locations, in addition to existing monitoring locations, confirmed the modelling results that the NO2 annual mean objective had been exceeded. In November 2013, following completion of the 2013 Progress Report, an Air Quality Management Area (AQMA) was declared in Musselburgh in relation to breaches and likely breaches of the Nitrogen Dioxide annual mean air quality objective. The extent of the AQMA is High Street, Musselburgh (A199) from its junction with Newbigging and extending westwards to the junction with Bridge Street and Mall Avenue (Ref 21). Figure 1.1 shows the extent of the AQMA.

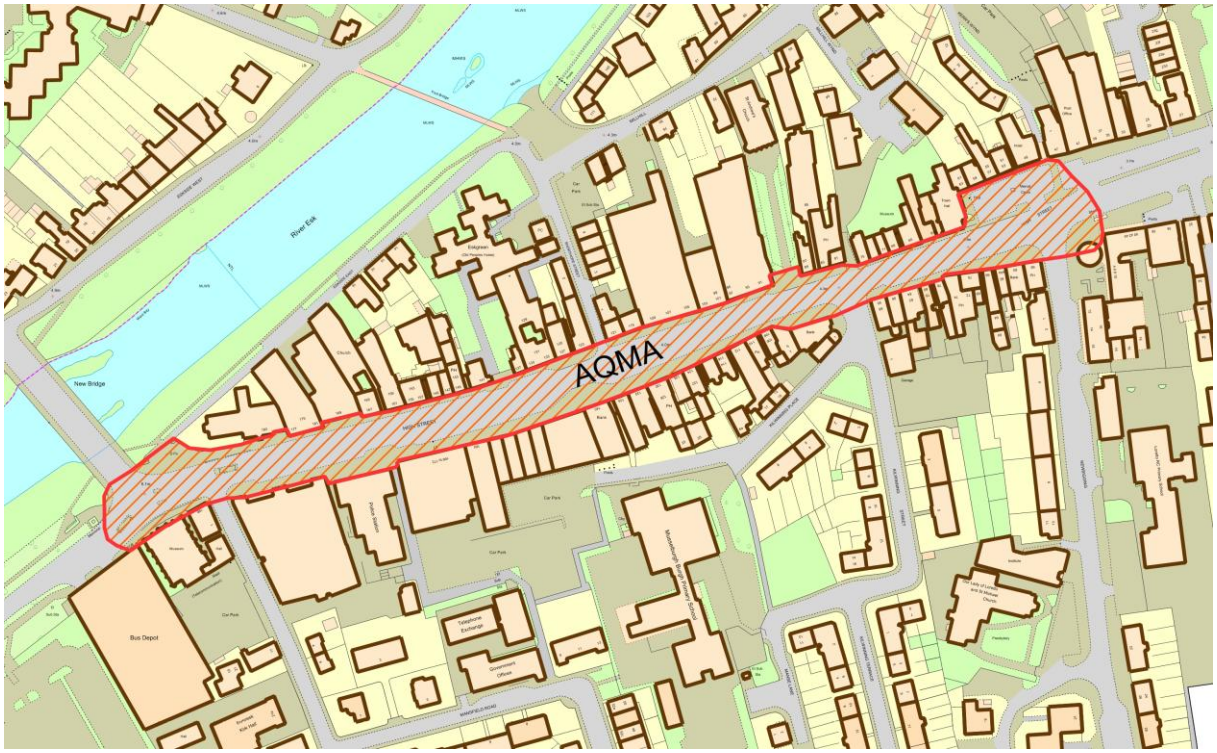
Following declaration of the AQMA East Lothian Council commissioned a Further Assessment of Air Quality in Musselburgh (Ref 22). The assessment provided the technical justification for the measures the authority later includes in any action plan and must be completed within 12 months of declaration of the AQMA. The Further Assessment was completed in September 2014 and confirmed the findings of the previous Detailed Assessment (Ref 18), namely that there are likely to be continued exceedences of the annual mean NO_2 objective where relevant exposure exists.
The Further Assessment estimated that ambient NOx reductions in the AQMA of up to 27% at some locations are required in order to achieve compliance with the annual mean NO2 objective and, furthermore, that a source apportionment exercise indicates that emissions from buses form the largest contribution at all locations along the High Street AQMA. Modelling of the mitigation scenarios agreed with the Council indicates that an integrated package of interventions would provide the best NOx reductions. Measures that reduce overall traffic, reduce queuing and reduce bus numbers, where appropriate, will reduce road NOx significantly. These measures are however very challenging (both financially and technically) to implement.

The contour plots and dispersion modelling prepared for this study indicate that the current AQMA boundary includes all relevant sources and does not require revocation or amendment at this time

The 2014 Progress Report (Ref 23) confirmed that NO_2 emissions continued to exceed, or were very close to, the Annual Mean Air Quality Objective at some locations within the AQMA

A summary of all previous Review and Assessment Reports is provided in Appendix 1

Figure 1.1 Map of AQMA Boundaries in Musselburgh due to exceedence of Nitrogen dioxide Annual Mean Air Quality Objective



2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

It was proposed following completion of the USA 2009 (Ref 14) and the subsequent Review of Passive and Automatic Monitoring of Nitrogen Dioxide in 2009 (Ref 24) that the NOx analyser previously located in Musselburgh High Street would be replaced with a new analyser to be located at Musselburgh North High Street, beside the existing BAM PM_{10} monitor. This work was completed in February 2010 providing a single air quality automatic monitoring station for Musselburgh that will provide the backbone of LAQM in future years in East Lothian. The current locations are shown in Figure 2.1. below:

Figure 2.1 Map(s) of Automatic Monitoring Sites (if applicable)

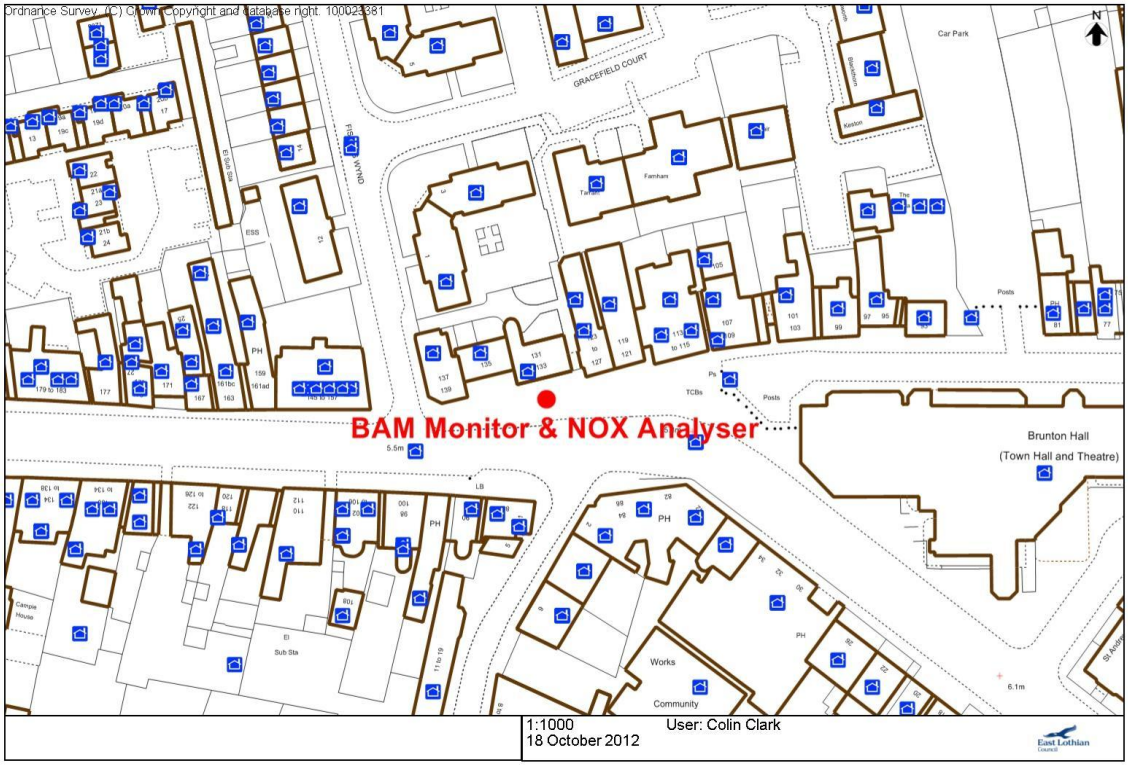


Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	Monitoring Technique	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road	Does this location represent worst-case exposure?
		X	Y						
Musselburgh North High Street - BAM	Roadside	333 941	672837	PM_{10}	BAM	N	Y (5m)	3m	Y
Musselburgh North High Street - NOx	Roadside	333 941	672837	NOx	Gas-phase chemilluminescence detection	N	Y (5m)	3m	Y

2.1.2 Non-Automatic Monitoring Sites

Following on from the completion of the USA 2009 (Ref 14) NO_2 Diffusion Tube numbers 1, 4, 6, 7, 8, 9 and 10 would continue to be used to monitor NO_2 in Musselburgh. Three new tubes, numbered 23, 24 and 25 have been co-located with the new NOx Analyser beside the BAM unit at North High Street, Musselburgh. Two additional tubes, numbered 26 and 27 have also been introduced in the vicinity of Salters Road, Wallyford to monitor NO_2 in order to assess any potential impact that may arise as a consequence of the proposed Wallyford Expansion and the likely increase in Road Traffic along Salters Road.

As a result of the abovementioned Detailed Assessment of Nitrogen Dioxide due to road traffic sources in Musselburgh that was completed in June 2012 (Ref 18) East Lothian Council also started monitoring NO_2 concentrations at 5 new locations on 3rd May 2012 using passive diffusion tubes. These new monitoring sites are located at Tube 29 (167 High Street), Tube 30 (137 High Street), Tube 31 (69 High Street), Tube 32 (86 High Street) and Tube 28 (15 Bridge Street) where dispersion modelling indicates that exceedences of the NO_2 annual mean objective had occurred during 2011

The current locations of all diffusion tubes are shown in Figures 2.2 - 2.5 below:

Figure 2.2 Map of Non-Automatic Monitoring Sites in Musselburgh

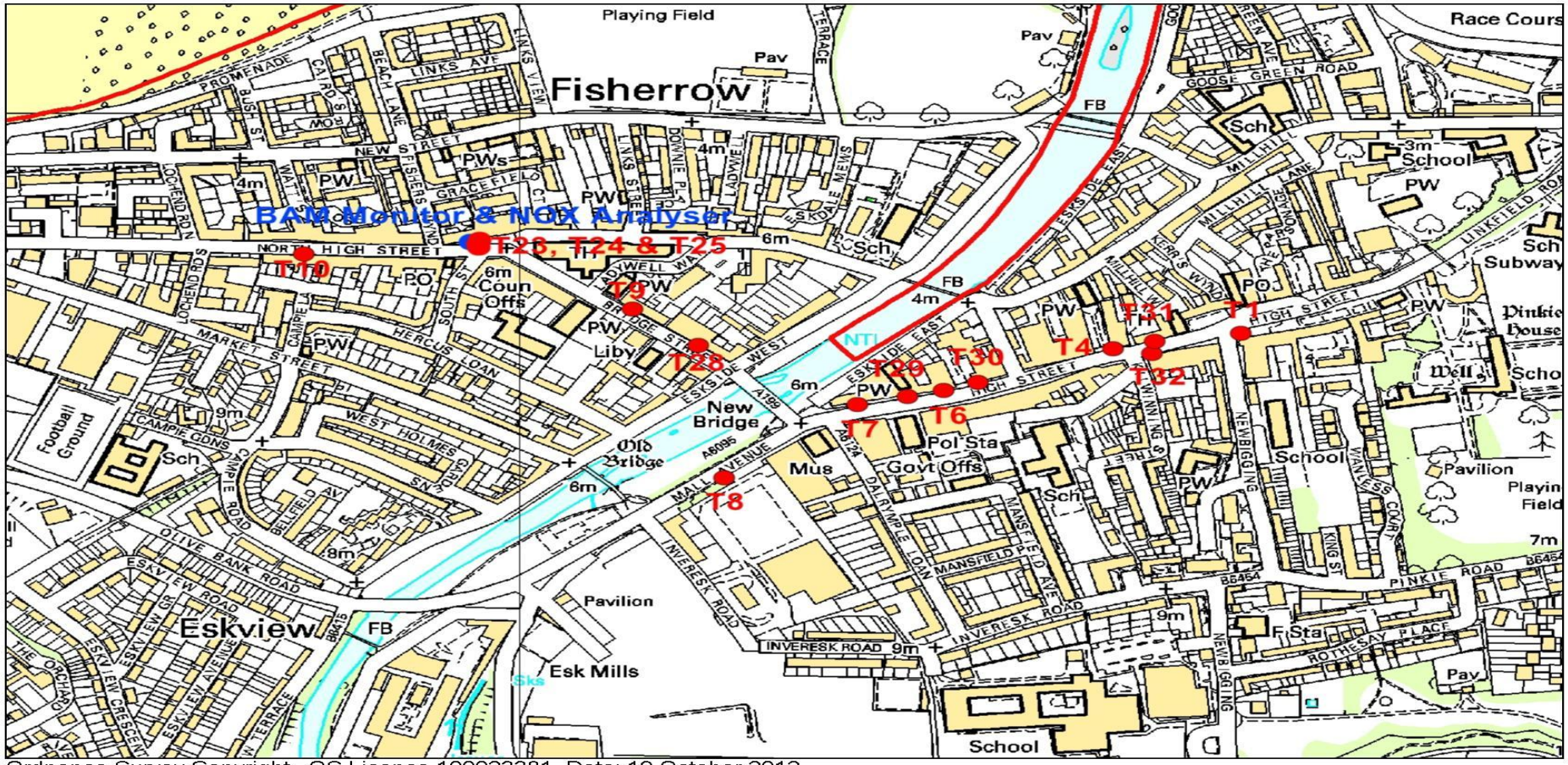


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Figure 2.3: Map of Non-Automatic Monitoring Sites in Wallyford

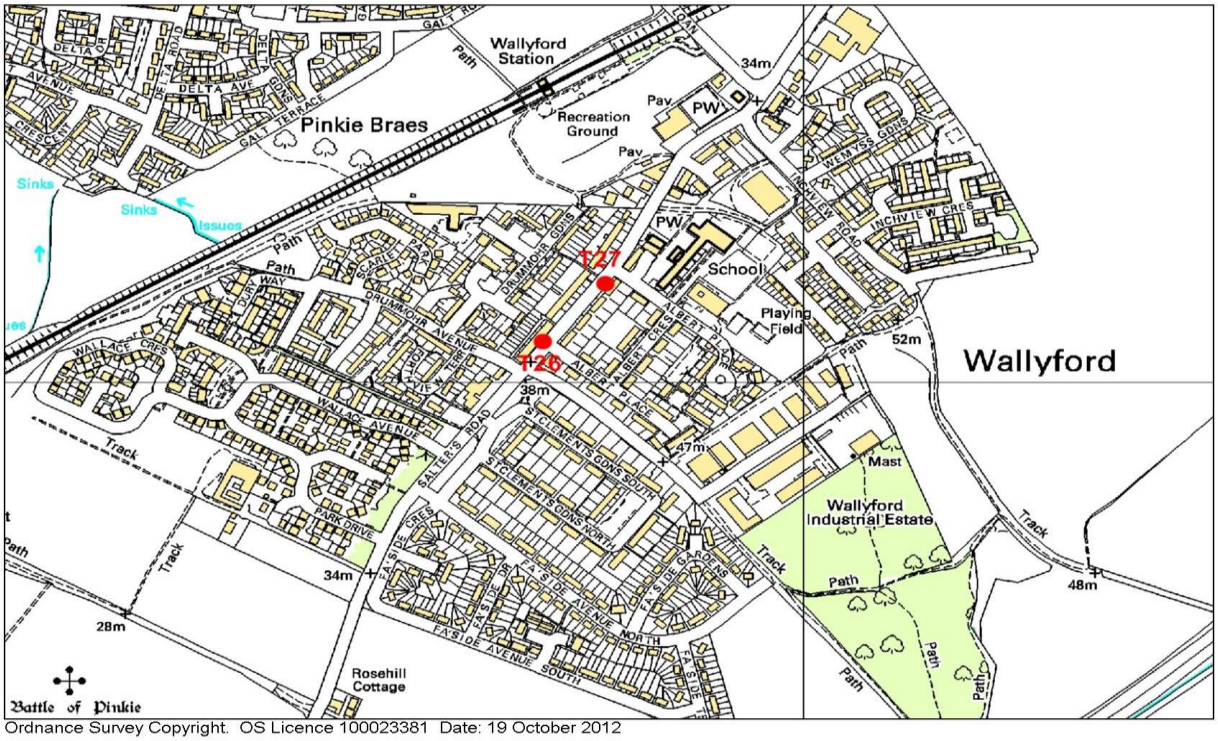

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Figure 2.4: Map of Non-Automatic Monitoring Sites in Tranent

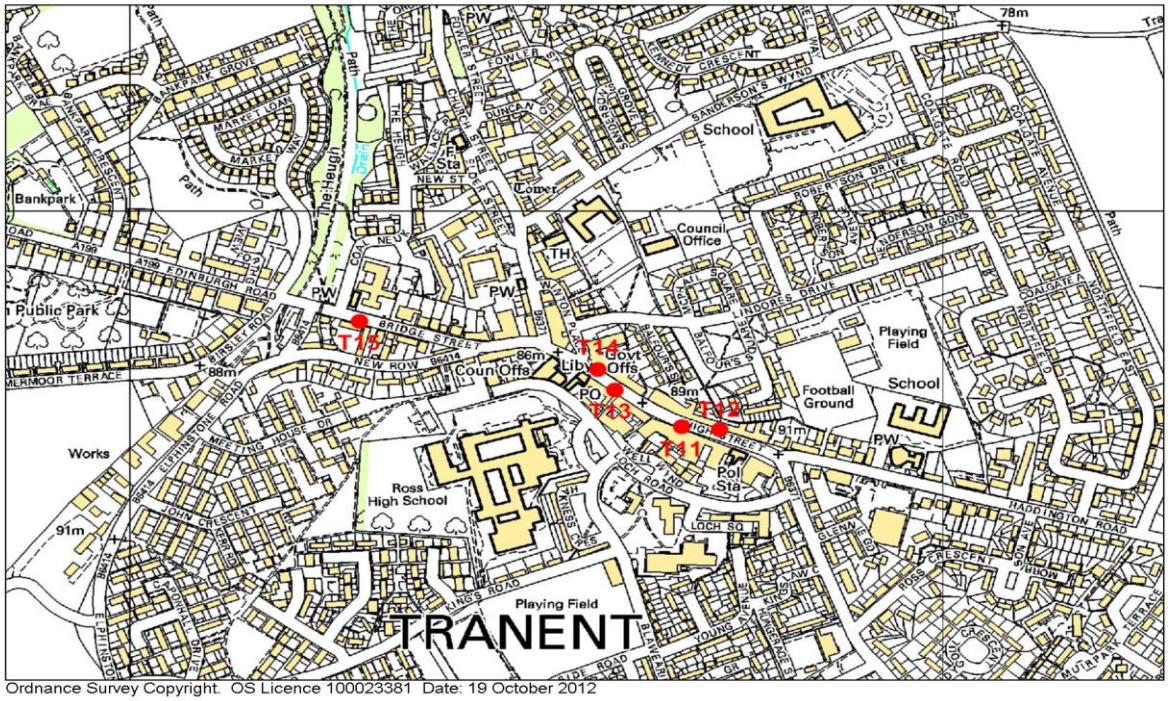

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Figure 2.5: Map of Non-Automatic Monitoring Sites in Haddington

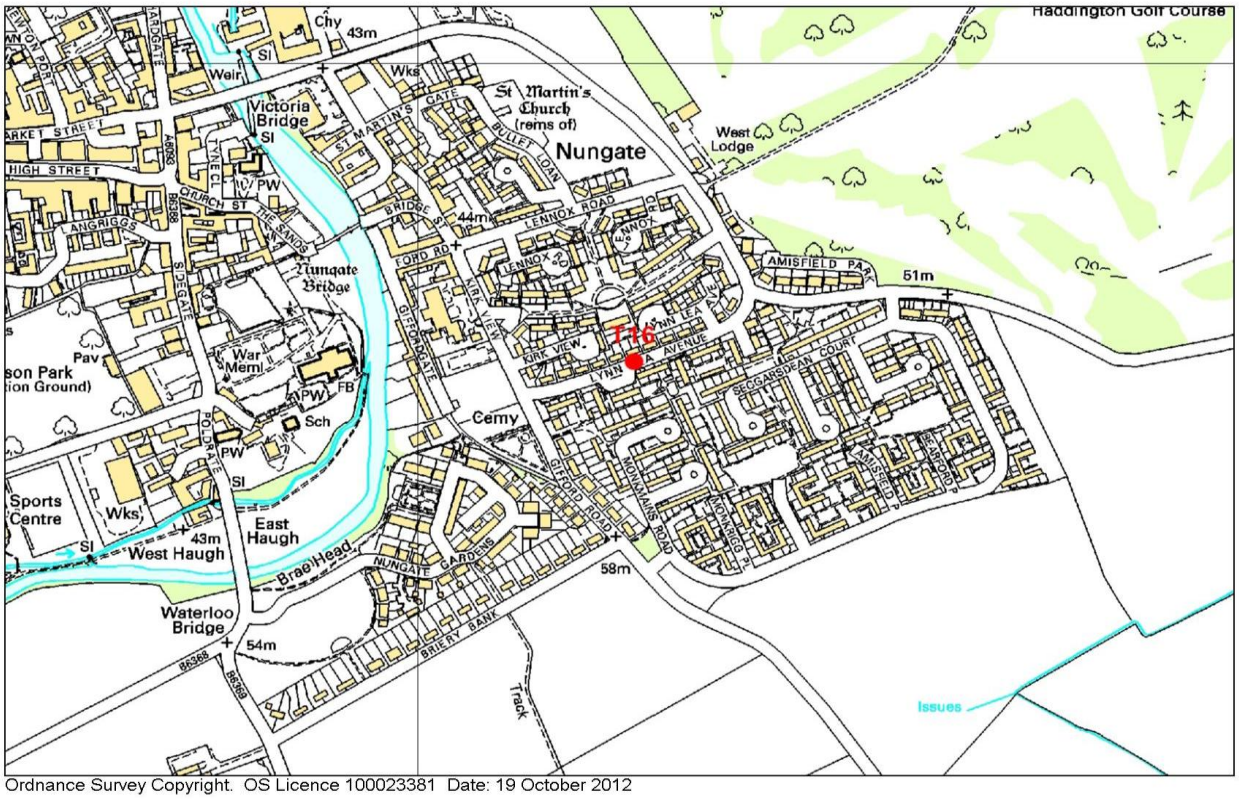


Table 2.2 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	In AQMA?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location?
		X	Y					
1. Musselburgh – Newbigging Junction	Roadside	334659	672720	NO_2	N	Y (15m)	2m	Y
4. Musselburgh - 87 High St	Roadside	334526	672700	NO_2	N	Y (15m)	4m	Y
6. Musselburgh – 147 High Street	Roadside	334392	672652	NO_2	N	Y 20m)	3m	Y
7. Musselburgh – 183 High St	Roadside	334301	672632	NO_2	N	Y 20m)	3m	Y
8. Musselburgh - Mall Av	Roadside	334172	672524	NO_2	N	Y (25m)	4m	Y
9. Musselburgh – 45 Bridge Street	Roadside	334105	672750	NO_2	N	Y (3m)	4m	Y
10 Musselburgh – 150 North High St	Roadside	333800	672822	NO_2	N	Y (3m)	4m	Y
11. Tranent – 89 High St	Roadside	340686	672692	NO_2	N	Y (3m)	3m	Y
12. Tranent – 82 High St	Roadside	370738	672687	NO_2	N	Y (4m)	3m	Y
13. Tranent – 55 High Street	Roadside	340608	672738	NO_2	N	Y (4m)	3m	Y
14. Tranent – 26 High St	Roadside	340570	672780	NO_2	N	Y (2m)	2m	Y
15. Tranent – 58 Bridge St	Roadside	340112	672905	NO_2	N	Y (5m)	2m	Y
16. Haddington - Lyn Lea	Urban	352249	673631	NO_2	N	Y 8m)	3m	Y
23. Musselburgh - Co-located 133 N High St	Roadside	333941	672837	NO_2	N	Y (5m)	3m	Y
24. Musselburgh - Co-located 133 N High St	Roadside	333941	672837	NO_2	N	Y (5m)	3m	Y
25. Musselburgh - Co-located 133 N High St	Roadside	333941	672837	NO_2	N	Y (5m)	3m	Y
26. 116 Salters Rd	Roadside	336691	672055	NO_2	N	Y (5m)	2m	Y
27. 71 Salters Rd	Roadside	336769	672127	NO_2	N	Y (5m)	2m	Y
28. Musselburgh - 15 Bridge Street	Roadside	334164	672708	NO_2	N	Y (5m)	3m	Y
29. Musselburgh - 167 High Street	Roadside	334354	672643	NO_2	N	Y (5m)	3m	Y
30. Musselburgh - 137 High Street	Roadside	334427	672664	NO_2	N	Y (5m)	3m	Y
31. Musselburgh - 69 High Street	Roadside	334580	672713	NO_2	N	Y (5m)	3m	Y
32. Musselburgh - 86 High Street	Roadside	334578	672695	NO_2	N	Y (5m)	3m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

East Lothian Council concluded from previous rounds of review and assessment that the annual mean and 1-hour mean air quality objectives would be complied with by the target date of 31 December 2005 and would continue to be met. An air quality management area (AQMA) was not required although monitoring of NO_2 would continue using both the continuous analyser located at Musselburgh High Street and passive diffusion tubes located in Musselburgh and the other towns of Tranent and Haddington. Most recent reviews and assessments have, however, indicated exceedences of Annual Mean objective at various locations on Musselburgh High Street which resulted in declaration of an AQMA in November 2013. Ratified Nitrogen dioxide data for 2013 is shown in Appendix 2.

Automatic Monitoring Data

Table 2.3 Results of Automatic Monitoring for NO_2: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA ?	Valid Data Capture for period of monitoring %	Annual mean concentrations (μg/m^3)					
				2009	2010	2011	2012	2013	2014
Musselburgh North High Street – NOX	Roadside	N	89.8	NO DATA*	29	24	24	24	23

Note:* Following on from East Lothian Council's Progress Report in 2010 (Ref 16) and previous Review of Passive and Automatic Monitoring of Nitrogen Dioxide in East Lothian that was undertaken in 2009 (Ref 24) as described in Section 2.1 above, the monitoring data for nitrogen dioxide for 2009 is incomplete and, as such, there is insufficient data to report.

Table 2.4 Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring %	Number of Exceedences of hourly mean (200 μg/m^3) *If the period of valid data is less than 90% of a full year, include the 99.8th % ile of hourly means in brackets.*					
				2009	2010	2011	2012	2013	2014
Musselburgh North High Street - NOX	Roadside	N	81.3	NO DATA*	0	0 (94)	0	0 (101)	0 (78)

Note:* Following on from East Lothian Council's Progress Report in 2010 (Ref 16) and previous Review of Passive and Automatic Monitoring of Nitrogen Dioxide in East Lothian that was undertaken in 2009 (Ref 24) as described in Section 2.1 above, the monitoring data for nitrogen dioxide for 2009 is incomplete and, as such, there is insufficient data to report.

Diffusion Tube Monitoring Data

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2014

Site ID	LOCATION	Site Type	Within AQMA	Triplicate or Co-located	Data Capture 2014 (%)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.86) 2014 (µg/m^3)
1	Musselburgh – Newbigging Junction	Roadside	Y	N	100	N	N	30
4	Musselburgh - 87 High St	Roadside	Y	N	100	N	N	25
6	**Musselburgh – 147 High Street**	**Roadside**	**Y**	**N**	100	**N**	**N**	**43**
7	Musselburgh – 183 High St	Roadside	Y	N	83	N	N	38
8	Musselburgh - Mall Av	Roadside	N	N	100	N	N	23
9	Musselburgh – 45 Bridge Street	Roadside	N	N	100	N	N	28
10	Musselburgh – 150 North High St	Roadside	N	N	100	N	N	34
11	Tranent – 89 High St	Roadside	N	N	100	N	N	33
12	Tranent – 82 High St	Roadside	N	N	100	N	N	25
13	Tranent – 55 High Street	Roadside	N	N	100	N	N	29
14	Tranent – 26 High St	Roadside	N	N	100	N	N	24
15	Tranent – 58 Bridge St	Roadside	N	N	100	N	N	17
16	Haddington - Lyn Lea	Urban	N	N	100	N	N	8
23	Musselburgh - 133 N High St	Roadside	N	Triplicate & Co-located	100	N	N	23
24	Musselburgh - 133 N High St	Roadside	N	Triplicate & Co-located	100	N	N	22
25	Musselburgh - 133 N High St	Roadside	N	Triplicate & Co-located	100	N	N	23
26	Wallyford - 116 Salters Rd	Roadside	N	N	100	N	N	24
27	Wallyford - 71 Salters Rd	Roadside	N	N	100	N	N	22
*28	Musselburgh - 15 Bridge Street	Roadside	N	N	100	N	N	26
*29	Musselburgh - 167 High Street	Roadside	Y	N	100	N	N	39
*30	Musselburgh - 137 High Street	Roadside	Y	N	100	N	N	32
***31**	**Musselburgh - 69 High Street**	**Roadside**	**Y**	**N**	100	**N**	**N**	**44**
*32	Musselburgh - 86 High Street	Roadside	Y	N	100	N	N	37

Diffusion Tube Bias Adjustment Factor in 2013

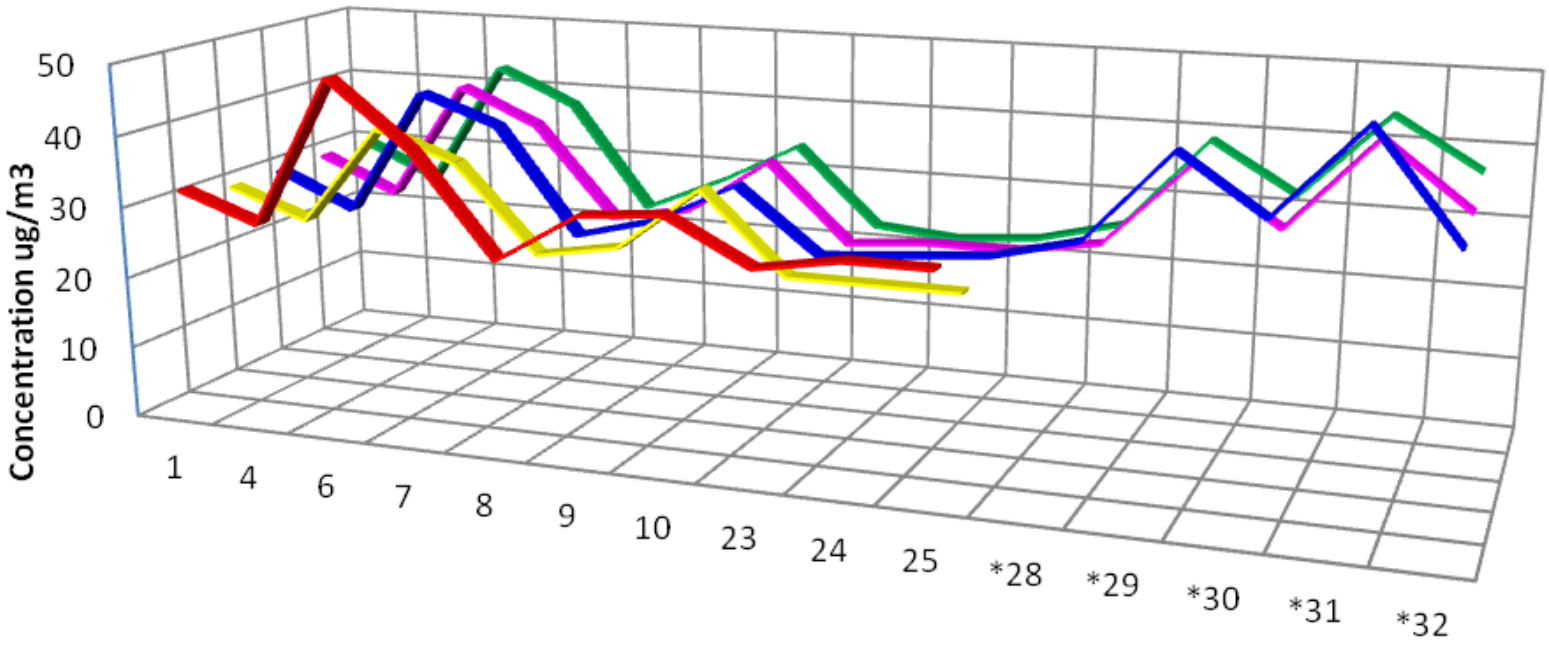
Three of the diffusion tubes are co-located with the continuous analyser on Musselburgh North High Street (Tube Numbers 23, 24 and 25). The bias adjustment factor has been calculated from the comparison of the diffusion tubes and continuous analyser measurements during 2014. The average for the co-located tubes was 26.7 $\mu g/m^3$. The average for the continuous analyser was 23 $\mu g/m^3$. This provided a diffusion tube bias adjustment factor of 0.86.

The NO_2 results and bias adjustment calculations for period shown in Table 2.5 are shown in Appendix 3.

Table 2.6 Results of NO_2 Diffusion Tubes (2010 to 2014)

Site ID	Location	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]				
				2010 (Bias Adjustment Factor = 0.97)	2011 (Bias Adjustment Factor = 0.8)	2012 (Bias Adjustment Factor = 0.8)	2013 (Bias Adjustment Factor = 0.8)	2014 (Bias Adjustment Factor = 0.86)
1	Musselburgh – Newbigging Junction	Roadside	Y	32	30	30	30	30
4	Musselburgh - 87 High St	Roadside	Y	28	26	25	25	25
6	**Musselburgh – 147 High Street**	**Roadside**	**Y**	**49**	**40**	**43**	**42**	**43**
7	Musselburgh – 183 High St	Roadside	Y	**40**	36	39	37	38
8	Musselburgh - Mall Av	Roadside	N	26	24	24	24	23
9	Musselburgh – 45 Bridge Street	Roadside	N	33	26	27	26	28
10	Musselburgh – 150 North High St	Roadside	N	34	35	33	34	34
11	Tranent – 89 High St	Roadside	N	33	22	30	32	33
12	Tranent – 82 High St	Roadside	N	32	24	28	28	25
13	Tranent – 55 High Street	Roadside	N	34	29	28	28	29
14	Tranent – 26 High St	Roadside	N	33	33	26	24	24
15	Tranent – 58 Bridge St	Roadside	N	27	19	19	19	17
16	Haddington - Lyn Lea	Urban	N	11	12	8	8	8
23	Musselburgh - 133 N High St	Roadside	N	28	24	24	23	23
24	Musselburgh - 133 N High St	Roadside	N	30	24	25	24	22
25	Musselburgh - 133 N High St	Roadside	N	30	24	26	24	23
26	Wallyford - 116 Salters Rd	Roadside	N	31	26	23	23	24
27	Wallyford - 71 Salters Rd	Roadside	N	28	20	23	24	22
*28	Musselburgh - 15 Bridge Street	Roadside	N	N/A	N/A	29	26	26
*29	Musselburgh - 167 High Street	Roadside	Y	N/A	N/A	**42**	38	39
*30	Musselburgh - 137 High Street	Roadside	Y	N/A	N/A	34	30	32
***31**	**Musselburgh - 69 High Street**	**Roadside**	**Y**	N/A	N/A	**47**	**43**	**44**
*32	Musselburgh - 86 High Street	Roadside	Y	N/A	N/A	32	34	37

Figure 2.6 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites in Musselburgh 2010-2014



	1	4	6	7	8	9	10	23	24	25	*28	*29	*30	*31	*32
2010	32	28	49	40	26	33	34	28	30	30					
2011	30	26	40	36	24	26	35	24	24	24					
2012	30	25	43	39	24	27	33	24	25	26	29	42	34	47	32
2013	30	25	42	37	24	26	34	23	24	24	26	38	30	43	34
2014	30	25	43	38	23	28	34	23	22	23	26	39	32	44	37

As can be seen from Figure 2.6 above, the results of diffusion tube monitoring sites in Musselburgh has remained fairly consistent since 2010. However, there has been a slight reduction at the following sites since 2012:

1. Site 7 – Musselburgh – 183 High St (down from 39 ugm^{-3} in 2012 to 38 ugm^{-3} in 2014)
2. Site 28 – Musselburgh - 15 Bridge Street (down from 29 ugm^{-3} in 2012 to 26 ugm^{-3} in 2014)
3. Site 29 – Musselburgh - 167 High Street (down from 42 ugm^{-3} in 2012 to 39 ugm^{-3} in 2014)
4. Site 30 – Musselburgh - 137 High Street (down from 34 ugm^{-3} in 2012 to 32 ugm^{-3} in 2014)
5. Site 31 – Musselburgh - 69 High Street (down from 47 ugm^{-3} in 2012 to 44 ugm^{-3} in 2014)

However, it is prudent to note that the following sites have experienced a slight increase since 2012:

1. Site 9 – Musselburgh – 45 Bridge Street (up from 27 ugm^{-3} in 2012 to 28 ugm^{-3} in 2014)
2. Site 10 – Musselburgh – 150 North High St (up from 33 ugm^{-3} in 2012 to 34 ugm^{-3} in 2014)
3. Site 32 – Musselburgh - 86 High Street (up from 32 ugm^{-3} in 2012 to 37 ugm^{-3} in 2014)

The introduction of the Urban Traffic Control system SCOOT (Split Cycle Offset Optimisation Technique) in June 2013 may have had some impact as NO_2 levels have generally remained static or reduced slightly (eastbound) within the AQMA since its introduction, with the exception of Site 32 at 86 High Street (westbound) where there has been an increase. However, significant roadworks were undertaken in the vicinity of Site 32 between August-December 2014.

The main focus of the Action Plan will be to reduce overall traffic, reduce queuing and reduce bus numbers within the AQMA where possible.

2.2.2 Particulate Matter - PM_{10}

Table 2.7 Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration μg/m^3				
					2010	2011	2012	2013	2014
Musselburgh – North High Street BAM	Roadside	N	92.1	Y	12	13	12	16	17

Table 2.8 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean (50 μg/m^3) (if data capture is less than 90%, include the 90.4th percentile of 24-hour means in brackets)				
					2010	2011	2012	2013	2014
Musselburgh – North High Street BAM	Roadside	N	92.1	Y	0	1 (30)	0	2 (32)	3

2.2.3 Sulphur Dioxide (SO_2)

East Lothian Council do not carry out any monitoring of Sulphur dioxide

2.2.4 Benzene

East Lothian Council do not carry out any monitoring of Benzene

2.2.5 Other pollutants monitored

East Lothian Council do not carry out monitoring of any other pollutants

2.2.6 Summary of Compliance with AQS Objectives

East Lothian Council has examined the results from monitoring in the district.

Concentrations within the AQMA still exceed the annual mean objective for Nitrogen dioxide on Musselburgh High Street and the AQMA should remain.

Concentrations outside of the AQMA are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
Nitrogen dioxide	**Approach per Section A.1 of Box 5.3 LAQM TG (09)**	
	Use local knowledge to identify narrow congested streets Daily traffic flow (AADT) should be >5000 veh/day. A congested street will be one with slow moving traffic that is frequently stopping and starting due to pedestrian crossings, parked vehicles, etc throughout much of the day (not just during rush hours). The average speed is likely to be < 25 kph (15 mph). A narrow street will be one with residential properties within 2m of the kerb, and buildings on both sides of the road (the buildings on the other side of the road can be further from the kerb than 2m).	The High Streets in Musselburgh and Tranent and Court Street in Haddington were assessed in previous rounds of review and assessment. There are no new narrow congested streets that meet these criteria within East Lothian. There is no need to proceed further with this part.
	Question	
	Are there any roads meeting these criteria that are outside of traffic related AQMA's and have not previously been assessed?	N/A
	Action	
	No further action required.	

East Lothian Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
Nitrogen dioxide	**Approach per Section A.2 of Box 5.3 LAQM TG (09)**	
	Identify all busy streets (>10, 000 vehicles per day) where individuals may be exposed within 5m of the kerb for 1-hour or more that are new, or were not previously assessed. This should include streets with new exposure, where exposure was previously not present.	The busiest streets where people may spend 1-hour or longer close to traffic are those in or near the town centres of Musselburgh, Tranent and Haddington. These locations have been specifically identified and assessed in previous rounds of review and assessment through monitoring, screening methods and detailed dispersion modelling. There is no need to proceed further with this part.
	Obtain detailed information on traffic flows, speeds and proportion of different vehicle types.	
	Use the DMRB screening model to predict the current annual mean concentration at relevant locations.	
	Question	
	Are any of the predicted annual mean concentrations equal to or greater than 60μg/m^3?	N/A
	Action	
	No further action required.	

East Lothian Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
Nitrogen dioxide PM_{10}	**Approach per Section A.3 of Box 5.3 LAQM TG (09)**	
	Identify all roads with an unusually high proportion of HDV (>20%) that were not previously assessed or are new. This should include roads with new exposure, where exposure was previously not present.	There are no roads in East Lothian with an unusually high (>20%) proportion of heavy-duty vehicles. There is no need to proceed further with this part.
	Determine whether there is relevant exposure within 10m of these roads (20m in major conurbations, i.e. population >2 million).	
	Determine whether the flow of HDV is greater than 25, 000 vehicles per day.	
	Use the DMRB screening model to predict the current annual mean at relevant locations.	
	Question	
	Are any of the predicted NO_2 annual mean concentrations greater than 40$\mu g/m^3$ (for the annual mean objective)? Are there more than 35, 24-hour PM_{10} exceedences of 50$\mu g/m^3$ predicted? Are any of the predicted annual mean PM_{10} concentrations in 2010 greater than 18$\mu g/m^3$?	N/A
	Action	
	No further action required.	

East Lothian Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
Nitrogen dioxide PM_{10}	**Approach per Section A.4 of Box 5.3 LAQM TG (09)**	
	Identify "busy" junctions (> 10, 000 vehicles per day) that are new, or were not previously assessed. This should include streets where new exposure, where exposure was not previously present.	These types of junctions were specifically identified and assessed during previous rounds of review and assessment. There is no need to proceed further with this part.
	Determine whether there is relevant exposure within 10m of the kerb (20m in major conurbations, i.e. population >2 million).	
	Obtain detailed information on traffic flows, speeds and percentage of heavy-duty vehicles (all vehicles >3.5 tonnes).	
	Use the DMRB screening model to predict the current annual mean NO_2 concentration and the number of 24-hour exceedences of 50μg/m^3 at relevant locations.	
	Question	
	Are any of the predicted annual mean NO_2 concentrations greater than 40μg/m^3?	N/A
	Are more than 35, 24-hour PM10 concentrations above 50μg/m^3 predicted?	N/A
	Action	
	No further action required.	

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
PM_{10} (2010 objective - Scottish Authorities only)	**Approach per Section A.4 of Box 5.3 LAQM TG (09)**	
	Identify "busy" roads and junctions (> 10, 000 vehicles per day).It is only necessary to include busy roads or junctions not considered in previous Review and Assessment Reports, and/or where there has been a significant increase (>10% AADT) in traffic flows since the last assessment, and/or where there is new relevant exposure.	These types of junctions were specifically identified and assessed during previous rounds of review and assessment. There is no need to proceed further with this part.
	Determine whether there is relevant exposure within 10m of the kerb (20m in major conurbations, i.e. population >2 million).	
	Obtain detailed information on traffic flows, speeds and proportion of different vehicle types.	
	Use the DMRB screening model to predict the annual mean in 2010 at relevant locations.	
	Question	
	Are any of the predicted annual mean PM_{10} concentrations in 2010 greater than 18μg/m^3?	N/A
	Action (Scotland only)	
	No further action required.	

East Lothian Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

Approach 1

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
Nitrogen dioxide PM_{10}	**Approach 1 per Section A.5 of Box 5.3 LAQM TG (09) – This approach should be followed if an air quality assessment has been undertaken for the new or proposed road in question**	
	Obtain details of the air quality assessment that has been carried out for the new road (planning approval must be already granted).	There have been no roads constructed or granted planning consent since the first round of review and assessment.
	Question	
	Have any exceedences of the NO_2 or PM_{10} objectives been predicted at relevant locations?	N/A
	Action	
	No further action required.	

Approach 2

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
Nitrogen dioxide PM_{10}	**Approach 2 per Section A.5 of Box 5.3 LAQM TG (09) – This approach should be followed if there has been no previous air quality assessment.**	
	Establish whether the traffic flow on the new road is greater than 10, 000 vehicles per day or whether the new road has increased traffic flow on existing roads previously identified as having a) NO_2 annual mean concentrations greater than 36μg/m^3, or b) more than 30, 24-hour exceedences of the PM_{10} objective of 50μg/m^3 (or more than six exceedences in 2010 in Scotland). Use the DMRB screening model to predict the current NO_2 annual mean at relevant locations and/or the number of PM_{10} 24-hour exceedences of 50μg/m^3, (and for Scotland the annual mean for 2010) at relevant locations.	There have been no new roads constructed or granted planning consent since the first round of review and assessment.
	Question	
	Do any of the predicted concentrations exceed the air quality objectives?	N/A
	Action	
	No further action required.	

East Lothian Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
Nitrogen dioxide PM_{10}	**Approach per Section A.6 of Box 5.3 LAQM TG (09)**	
	Identify any roads with more than 10, 000 vehicles per day that have experienced "large" (>25%) increases in traffic.	There are no roads in East Lothian with more than 10,000 vehicles per day that have experienced 'large' (>25%) increases in traffic.
	Determine whether these roads had previously been identified as being "at risk" (annual mean > 36μg/m^3 at a relevant location) of exceeding the objectives.	
	Obtain detailed information on traffic flows, speeds and percentage of HDV's	
	Use the DMRB screening model to predict the current annual mean NO_2 concentration and the number of 24-hour exceedences of 50μg/m^3 in the current year at relevant locations. Predict the annual mean PM_{10} concentration in 2010 (Scotland only).	
	Question	
	Do any of the predicted concentrations exceed the air quality objectives?	N/A
	Action	
	No further action required.	

East Lothian Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
Nitrogen dioxide	**Approach per Section A.7 of Box 5.3 LAQM TG (09)**	
	Collect information on the daily movements of buses at the bus station.	All bus stations within East Lothian have vehicle flows of less than 1000 buses per day and have no relevant exposure within 10m of the bus station.
	Determine whether there is relevant exposure within 10m of any part of the bus station where buses are present (20m in major conurbations)	
	Determine whether the number of movements of buses and coaches is >2, 500 per day.	
	Use the DMRB screening model to predict the annual mean in the current year at relevant locations.	
	Question	
	Are any of the predicted annual mean NO_2 concentrations greater than 40μg/m^3?	N/A
	Action	
	No further action required.	
	Question	
	Are any of the predicted NO_2 annual mean concentrations greater than 60μg/m^3 (for the hourly mean objective)?	N/A
	Action	
	No further action required	

East Lothian Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
Nitrogen dioxide	**Approach per Section B.1 of Box 5.4 LAQM TG (09)**	
	Establish whether there is relevant exposure within 1,000 m of the airport boundary.	There are no airports in East Lothian.
	Obtain information on annual throughput of passengers and tonnes of freight in the most recent year possible. Calculate the total equivalent passenger numbers in million passengers per annum (mppa).	
	Question	
	Is the total equivalent passenger throughput more than 10 mppa? Is the existing background NO_x concentration above 25μg/m^3?	N/A
	Action	
	No further action required.	

East Lothian Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
Sulphur dioxide	**Approach 1 per Section B.2 of Box 5.4 LAQM TG (09) – Stationary locomotives (coal or diesel)**	
	Identify locations where diesel or steam locomotives are regularly stationary for periods of 15 minutes or more.	Freight trains deliver goods to the Viridor Landfill site adjacent to the Lafarge cement works at Dunbar.
	Establish whether there is the potential for regular outdoor exposure of individuals within 15m of the stationary locomotives.	There is no exposure to members of the public within 15m of each location identified above, where trains may occasionally stop.
	Obtain information on the number of trains per day that might affect these locations, and the typical duration that they are stationary with their engines running.	N/A
	Question	
	Are there three or more occasions a day when there might be a locomotive stationary with its engine running for 15 minutes or more?	N/A
	Action	
	No further action required.	

East Lothian Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
Nitrogen dioxide	**Approach 2 per Section B.2 of Box 5.4 LAQM TG (09) – Moving locomotives (diesel)**	
	Identify sections of track that may have a large number of movements of diesel locomotives (per Table 5.1 of LAQM TG (09))	There are no rail lines with a heavy traffic of diesel passenger trains within East Lothian.
	Identify whether the background annual mean NO_2 concentration is above 25μg/m^3.	
	Establish whether there is the potential for long-term exposure within 30m of the edge of the tracks.	
	Question	
	Are there any sections of rail line meeting the above criteria?	N/A
	Action	
	No further action required.	

East Lothian Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
Sulphur dioxide	**Approach per Section B.3 of Box 5.4 LAQM TG (09)**	
	Establish whether there is relevant exposure within: 250m and 1km of the berths and main areas of manoeuvring.	There are no shipping ports within East Lothian.
	Collect information on the number of ship movements per year.	
	Question	
	Are there between 5, 000 and 15, 000 movements per year (and exposure within 250m)? Are there more than 15, 000 movements per year (and exposure within 1km)?	N/A
	Action	
	No further action required.	

East Lothian Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
All pollutants	**Approach 1 per Section C.1 of Box 5.5 of LAQM TG (09)**	
	Obtain details of the air quality assessment that has already been carried out for the new industrial source (for which planning approval has been granted).	In March 2015 FCC Environment (UK) Ltd applied for planning permission to Midlothian Council for the Erection of a waste recycling and treatment facility including combined heat and power plant facility at the former Millerhill Marshalling yards in Midlothian (Ref 25) , just outside Musselburgh. This application is awaiting determination by Midlothian Council and East Lothian Council has been consulted due to concerns regarding, *inter alia*, impacts on air quality, particularly due to Nitrogen dioxide within the AQMA on Musselburgh High Street. The Environmental Impact Assessment (Ref 26) submitted with the application concluded that there would be no significant impact upon local air quality due to the proposed development. The facility, if granted Planning Consent, will operate as a Part A Installation under the Pollution Prevention & Control (Scotland) Regulations 2012 under a Permit issued and enforced by SEPA.
	Question	
	Have any exceedences of the objectives been predicted at relevant locations?	No
	Action	
	No further action required.	

East Lothian Council has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
All pollutants	**Approach 2 per Section C.1 of Box 5.5 of LAQM TG (09)**	
	Determine whether any of the sources identified during previous rounds of Review and Assessment have: Experienced substantially increased emissions (>30%). Received new relevant exposure in their vicinity	Sources identified during previous rounds as potentially significant are Cockenzie Power Station and the Lafarge Cement Works. However, Cockenzie Power Station has now ceased production and is closed. Information on emissions of NO_x, Sulphur dioxide and Particulates for Lafarge Cement Works was obtained from SEPA for 2011 and 2014. **<u>Lafarge Cement Works</u>** In summary, between 2011 and 2014: NO_x emissions have increased from 669 to 1146 Tonnes per annum, i.e. an increase of 71%. SO_2 emissions have increased from 590 to 821 Tonnes per annum, i.e. an increase of 39% Total Particulate emissions have increased from 26 to 34 Tonnes per annum, i.e. an increase of 30%. As there has been a significant increase in emissions (>30%), largely due to an increase in operational hours of the plant, a further assessment is required in respect of Lafarge Cement Works. The screening assessment for Lafarge Cement Works was carried out using the nomograms detailed in LAQM.TG (09). Details of the assessments are shown in Appendix 4.
	Obtain information on the total annual emission of the pollutant, and the height of the emission.	
	Use the nomograms to determine if the source requires further assessment.	
	Question	
	Do the emissions exceed the threshold in the relevant nomogram?	NO
	Action	
	No further action required.	

East Lothian Council has assessed industrial installations with substantially increased emissions and concluded that it will not be necessary to proceed to a Detailed Assessment.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
All pollutants	**Approach 3 per Section C.1 of Box 5.5 of LAQM TG (09)**	
	Determine whether the installation is likely to give rise to significant pollutant emissions.	There are no new or significantly changed installations with no previous Air Quality Assessment within East Lothian.
	Obtain information on the total annual emission of the pollutant, and the height of the emission.	
	Use the nomograms to determine if the source requires further assessment.	
	Question	
	Does the source exceed the threshold in the relevant nomogram?	N/A
	Action	
	No further action required.	

East Lothian Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
Benzene	**Approach per Section C.2 of Chapter 5 of LAQM TG (09)**	
	Identify any major fuel storage depots handling petrol that have not been covered by previous Review and Assessment reports. Include nearby sources in neighbouring authorities.	There are no major fuel storage depots handling petrol in East Lothian.
	Determine the distance of the nearest relevant exposure.	
	Establish the annual emissions from the storage depot.	
	Use the nomograms in Figure 5.16 (2010 objective) to determine if the source requires further assessment.	
	Question	
	Does the source exceed the threshold in the nomograms?	N/A
	Action	
	No further action required.	

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
Benzene	**Approach per Section C.3 of Chapter 5 of LAQM TG (09)**	
	Identify all petrol stations with an annual throughput of more than 2000m^3 of petrol (2 million litres per annum), and with a busy road nearby (> 30, 000 vehicles per day), that have not been covered by previous Review and Assessment reports.	There are no petrol stations within East Lothian that meet the criteria described.
	Determine whether there is relevant exposure within 10m of the pumps.	
	Question	
	Does the petrol station meet the above criteria?	N/A
	Action	
	No further action required.	

East Lothian Council confirms that there are no petrol stations meeting the specified criteria**.**

5.4 Poultry Farms

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
PM_{10}	**Approach per Section C.4 of Chapter 5 of LAQM TG (09)**	
	Identify any farms housing in excess of: 400,000 birds if mechanically ventilated, 200, 000 birds if naturally ventilated, 100, 000 birds for any turkey unit.	Information from SEPA and East Lothian Council's Trading Standards confirms that the only PPC site for Poultry Farms in East Lothian is located at Appin Farm, North Berwick that can accommodate up to 98,400 birds and is mechanically ventilated. There are no poultry farms, including turkey units, in East Lothian that meet the criteria described.
	Establish whether there is relevant exposure within 100m of the poultry units.	
	Question	
	Does the poultry unit meet these criteria?	N/A
	Action	
	No further action required.	

East Lothian Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
Nitrogen dioxide PM_{10}	**Approach per Section D.1a of Box 5.8 of LAQM TG (09)**	
	Identify plant that is burning biomass in 50Kw to 20MW units.	The only Biomass unit identified is located at Queen Margaret University, Musselburgh which has a 1500KW unit. However, a Detailed Assessment for this unit was completed in October 2010 (Ref 15) that concluded that the biomass emissions will not result in any exceedence of the relevant Air Quality Objectives and that the process contributions are typically a small percentage of the overall Air Quality Objectives.
	Obtain information on: • Height of the stack • Diameter of the stack • Dimensions of buildings within 5 times the stack height (above the ground) • Description of the combustion appliance • Maximum emission rates (g/sec) of NO_x and PM_{10} or maximum thermal capacity	
	Calculate the "background adjusted" emission rates using the procedure set out in Para 5.78 (PM_{10}) and 5.81 and 5.84 (NO_2)	
	If necessary, calculate the "effective stack height"	
	Use the nomograms in Figure 5.19 (PM10) AND Figure 5.20 (NO2) to determine whether the source requires further assessment.	
	Question	
	Does the source exceed the threshold in the relevant nomograms?	N/A
	Action	
	No further action required.	

East Lothian Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.2 Biomass Combustion – Combined Impacts

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
PM_{10}	**Approach per Section D.1b of Box 5.8 of LAQM TG (09)**	
	Identify the areas in 500x500m squares with the highest densities of houses and service sector biomass combustion appliances.	No information is currently available on densities of houses and service sector biomass combustion appliances other than the unit already assessed above.
	Identify the types of appliances used in each 500x500m area.	
	Count the numbers of each appliance type in each 500x500m square. Multiply the number of houses for each appliance type by the annual household emission shown in Table 5.3. Sum the emissions from each of the domestic appliance types to give the total annual domestic emission from the 500x500m square.	
	Estimate the floor space occupied in the service sector in each of the identified 500x500m squares for each of the identified types of solid-fuel burning plant. Multiply the service sector floor space (in hectares) for each appliance type by the annual service sector emission per hectare. Sum the emissions from each of the sector service appliance types to give the total annual service sector emission from the 500x500m square.	
	Add the service sector emissions to the domestic emissions to give the total emissions from the 500x500m square	
	Estimate the fraction of space in the 500x500m square occupied by solid-fuel burning premises or domestic properties. Divide the annual emission by the fraction occupied by solid-fuel burning to give the emission density for the square (kg emissions per 500x500m area).	
	Question	
	Does the source exceed the threshold in the relevant nomogram? (Use nomogram in Figure 5.22 in Scotland).	N/A
	Action	
	No further action required	

East Lothian Council confirms that there are no biomass combustion plant in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
Sulphur dioxide	**Approach per Section D.2 of Chapter 5 of LAQM TG (09)**	
	Identify areas where significant coal burning takes place. Smokeless fuel has similar sulphur content to coal and so should be treated in the same way.	There are no additional areas of domestic coal burning that have not been assessed in previous rounds of review and assessment.
	Collect information on the actual use of coal/smokeless fuel in these areas.	
	Question	
	Does the density of coal burning premises exceed 100 per 500x500m area?	N/A
	Action	
	No further action required.	

East Lothian Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

RELEVANT POLLUTANTS	STEPS TO BE TAKEN TO COMPLETE ASSESSMENT	NOTES RELEVANT TO EACH STEP
PM_{10}	**Approach per Section E of Box 5.10 of LAQM TG (09)**	
	Obtain details of any air quality assessment already carried out for the relevant source.	Other sources of dust in East Lothian were screened during the previous round of review and assessment and no further sources have been identified.
	Establish whether there is relevant exposure "near" to the source(s) of dust emissions.	
	Determine whether there are dust concerns associated with the facility.	
	Question	
	Is there relevant exposure "near" to a source of dust emissions? Are there recent complaints about dust? Does visual inspection indicate significant dust emissions or dust tracked out of the site onto public roads?	N/A
	Action	
	No further action required.	

East Lothian Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

The results of new monitoring data indicate that the Objectives for all pollutants with the exception of NO_2, are being met.

Passive monitoring of Nitrogen dioxide on Musselburgh High Street continues to indicate concentrations at locations that have exceeded, or are very close to, the Annual Mean Objective. Accordingly, an Air Quality Management Area was declared in November 2013 (Ref 21) in Musselburgh in relation to breaches and likely breaches of the Nitrogen Dioxide annual mean air quality objective (as specified in the Air Quality (Scotland) Regulations 2000 (Ref 4) as amended by the Air Quality (Scotland) Amendment Regulations 2002 (Ref 5).

Monitoring results for 2014 indicate that the current AQMA boundary includes all relevant sources and does not require revocation or amendment at this time.

The results of automatic monitoring of PM_{10} confirm that both the annual and 24-hour mean objectives continue to be met. PM_{10} levels will continue to be monitored to ensure compliance with Air Quality Objectives

8.2 Conclusions from Assessment of Sources

The Updating and Screening Assessment concludes that there are no new Road Traffic or other Transport sources or Fugitive and Uncontrolled sources that will result in exceedences of any air quality objective. Furthermore, the assessment of existing Industrial Sources with substantially increased emissions (Lafarge Cement Works, Dunbar) has concluded that there will be no exceedence of Air Quality Objectives.

8.3 Proposed Actions

The Updating and Screening Assessment has not identified the need to proceed to a Detailed Assessment for any pollutant.

The Updating and Screening Assessment has not identified any need for additional monitoring, or changes to the existing monitoring programme.

The Updating & Screening Assessment indicates that the current AQMA boundary includes all relevant sources and does not require revocation or amendment at this time.

East Lothian Council has engaged the services of Ricardo Energy and Environment (formerly Ricardo-AEA) to act as Air Quality Consultants with regards to the development and implementation of its Action Plan to address exceedences of the Nitrogen dioxide Annual Mean Air Quality Objective within the Air Quality Management Area in Musselburgh.

Before any Draft Action Plan can be published for consultation with relevant stakeholders The Council will have to finalise details within the Local Development Plan (LDP) with regards to preferred development sites to allow for future development of 10, 000 new homes within the County. When these have been identified and published SIAS have been commissioned to build a micro-simulation (S-paramics) model of the strategic and local road network to form a 2012 base and predict cumulative traffic impacts on the strategic and local road network having regard to future development of these preferred sites. Modelling of the preferred transport related mitigation measures from the list below can then be carried out to calculate vehicle emissions and their impacts upon Air Quality Objective pollutant levels and confirm which measures to take forward for inclusion in the draft Action Plan

These transport related mitigation measures include:

1. Opening Inveresk Rd in Musselburgh
2. Opening Electricity Bridge in Musselburgh + Signalise A199 / New St Junction
3. Opening Dalrymple Loan (Caprice / Bus Station) Link to Mall Avenue. With Bus only access from Mall Avenue to High St and Dalrymple Loan closed at Caprice (apart from emergency access)
4. Opening Inveresk Rd & Electricity Bridge in Musselburgh
5. Opening Dalrymple Loan /Mall Ave Link & Electricity Bridge in Musselburgh
6. Provision of a One way Giratory (High St, Newbigging, Inveresk Rd, Dalrymple Load). High St has 2 way Bus + taxi & larger Pedestrian Areas
7. Relocating bus stops in Musselburgh High St

The results of the model will not be available until early in 2016. However, as the main source of pollutants and consequently cause for the exceedence of the Nitrogen dioxide Air Quality Objective is Road Traffic, this information is vital to the implementation of key measures that will be included in the Draft Action Plan.

In the meantime the Council is actively exploring the possibility of setting up an ECO Stars project which encourages and helps operators of HGVs, buses, coaches, vans and taxis to run fleets in the most efficient and green way. The scheme provides recognition for best operational practices, and guidance for making improvements. The ultimate aim is to reduce fuel consumption which naturally leads to fewer vehicle emissions and has the added benefit of saving money.

Other options being explored include the feasibility of introducing a Low Emission Zone in Musselburgh whereby the most polluting vehicles are regulated. Usually this means that vehicles with higher emissions cannot enter the area. In some low emission zones the more polluting vehicles have to pay more if they enter the low emission zone.

Progress on development and Implementation of the Action Plan will be reported in future LAQM Review and Assessment Reports, the next of which will be the Progress Report due April 2016.

A summary of all measures to be considered for inclusion in the Action Plan are as follows:

Types of Measures		
Type	**Description**	**Notes**
1	Strategic measures	Road transport emissions constitute a significant source of air pollution across the UK, and have contributed to the declaration of numerous Air Quality Management Areas. Due to the prevalence of road transport, a local long-term strategy is required to bring about a progressive reduction in emissions from the road transport sector in future years and encourage improvements in local air quality as a result. Furthermore, in Scotland, a more stringent annual mean objective for PM_{10} is in place. Consequently, background concentrations of particulate matter make a significant contribution to local PM_{10} concentrations. A long-term strategy aimed at reducing concentrations from these sources might include: • Building the capacity to better assess and manage the environmental impacts from road transport. • Specific commitments or targets within local development and transport planning policy to significantly reduce the impacts of new development.
2	Move sources away from the AQMA	Road transport emissions have been shown to represent the principle source of NOx within the AQMA. The construction of new roads could divert traffic away from the roads in the AQMAs. Less traffic on these roads results in lower pollution levels in the AQMAs. However, the opportunity to build such roads is frequently absent. In cases where such roads can be built, care needs to be exercised that the locations where the new roads are built do not become AQMAs in turn. **Note that this option moves emissions from one location to another with no requirement to reduce them. Overall emissions may be increased**

		by such actions.
3	Traffic Management – optimisation of traffic movement through AQMA	Changes in how the roads in the AQMA are signed or otherwise managed may reduce emissions from road transport a) by diverting some traffic onto better routes for them, or b) by reducing congestion/ stationary traffic. **Note that the opportunity to take such action is frequently limited.**
4	Reduce emissions from sources by technical means	The majority of vehicles using roads in the AQMA are conventional petrol or diesel powered vehicles with a range of ages. There are many technical options to convert such vehicles into ones using cleaner engine and fuel technology. By accelerating the uptake of these technologies the emissions in the AQMAs would be reduced. Note that technology does not always work in a positive sense for all emissions. They sometimes trade benefits for one pollutant against negative aspects for another one.
5	Reduce emissions from sources by reducing the demand for travel or achieving better travel choices	An important way to reduce emissions from transport is to reduce the number of journeys made through the AQMA. This could be achieved either through reducing the need to make some journeys, or by ensuring that these journeys are made via a less polluting form of transport. The success of such measures depends on policies that influence how people make travel choices. Note that there is increasing emphasis placed on such policies and that they work holistically by reducing emissions of all pollutants and greenhouse gases.
6	Other	May include a variety of measures e.g. targeting reduced emissions from domestic sources, industry or statutory nuisance.

Within the above measures, the following specific measures will be considered for inclusion within the Action Plan:

List of Possible AQAP Measures
Strategic Measures
Improving links with Local Transport Strategy
Improving links with Local Planning and Development framework
Encourage Integration of AQ with other Council strategies
Air Quality Guidance note for Developers
Move receptors away from AQMA
Create alternative accommodation for the residents of Musselburgh High Street area.
Move sources away from AQMA
Local ban on freight, car or bus traffic
Pedestrianisation of High Street
Traffic Management – optimisation of traffic movement through AQMA
Urban Clearway
Target reduce local emissions from freight operations
Relief Road
Implementation of new Urban Traffic Management and Control system and changes to pedestrian crossings
Parking Management and Control
Reduce number of buses through timetable changes.
Remove bus stops from High St.
1. Open Inveresk Rd in Musselburgh
2. Open Electricity Bridge in Musselburgh + Signalise A199 / New St Junction
3. Open Dalrymple Loan (Caprice / Bus Station) Link to Mall Avenue. With Bus only access from Mall Avenue to High St and Dalrymple Loan closed at Caprice (apart from emergency access)
4. Open Inveresk Rd & Electricity Bridge in Musselburgh
5. Open Dalrymple Loan /Mall Ave Link & Electricity Bridge in Musselburgh
6. One way Giratory (High St, Newbigging, Inveresk Rd, Dalrymple Load) High St has 2 way Bus + taxi & larger Ped Areas
10. Bus Stop relocations in Musselburgh High St

List of Possible AQAP Measures
Reduce emissions from sources by technical means
Road User/ Work Place Charging
Vehicle emissions testing
Idling Vehicle Enforcement
Retrofitting Council Fleet
Development of infrastructure for cleaner vehicle fuels
Vehicle scrappage incentives
Speed Controls
Target reduced emissions from buses
Green Procurement (Council) and fleet management – Council fleets and contract vehicles.
Eco-driving training policy (East Lothian Council)
Reduce the emissions from sources by means of encouraging better travel choices/ behavioural change
Road use charging and workplace parking levy
Bus lanes
Relocating bus stops
Improved signage – AQMA signs
Provision of information regarding air quality and travel options – includes awareness raising
Promotion of alternative modes (cycling + walking) by improving/promoting cycle paths, for example.
Green Travel Plans for large institutions and businesses.
13. Larger Trains & Platforms at Musselburgh + Wallyford
Other
Home Energy Efficiency
Environmental Nuisance (including bonfires)

9 References

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Appendices

Appendix 1: Summary of Previous Rounds of Review and Assessment

Summary of Previous Review and Assessment Reports				
ROUND	**REPORT TYPE**	**REPORT DUE DATE**	**REPORT COMPLETION DATE**	**CONCLUSIONS**
2	**Updating & Screening Assessment**	**April 2003**	March 2004	No further assessments required for **Carbon Monoxide, Benzene, Lead and 1,3-Butadiene**. Detailed Assessments required for: **Nitrogen Dioxide** due to road traffic sources in Musselburgh High St **Sulphur Dioxide** due to industrial sources (Cockenzie Power Station and Lafarge Cement Works) **PM10** due to road traffic sources in Musselburgh High St and North High St and also due to industrial source (Cockenzie Power Station)
2-1	**Detailed Assessment**	**April 2004**	**April 2005**	**Nitrogen Dioxide** due to road traffic in Musselburgh High St expected to meet Objectives by target year of 2005. No Further Assessment required at this time. **Sulphur Dioxide** in vicinity of Cockenzie Power Station was not forecast to exceed Objectives. 15-minute mean Objective forecast to be slightly exceeded in vicinity of Lafarge Cement Works, although abatement equipment to be installed should ensure that Objective will be met. No further assessments required at this time. PM10 **Annual Mean Objective forecast to be exceeded in Musselburgh High St due to roadwork's and Cockenzie due to emissions from Coal Plant at Cockenzie Power Station. However, results were based on Osiris monitoring system and use of correction factors. Further Assessments to be carried out by East Lothian Council using TEOM Analyser for road traffic sources in Musselburgh and by SEPA using Gravimetric Sampler for industrial source in Cockenzie.**
2-2	**Progress Report**	**April 2005**	**August 2005**	**Nitrogen Dioxide** levels due to road traffic sources continue to comply with Objectives within Musselburgh and throughout East Lothian. PM10 **Further Assessments due to road traffic sources in Musselburgh and industrial source in Cockenzie still to be completed and results to be incorporated in Updating and Screening Assessment Report due in April 2006.**
3	**Updating & Screening Assessment**	**April 2006**	**August 2006**	No exceedences of any Objectives forecast. No Further Assessments required
3-1	**Progress Report**	**April 2007**	**July 2007**	**Nitrogen Dioxide** levels due to road traffic sources in Musselburgh and proposed expansions of Musselburgh Racecourse and Wallyford Village continue, and are forecast, to comply with Objectives. **PM10** levels due to road traffic in Musselburgh complied with using local correction factor but exceeded using national correction factor. TEOM unit to be replaced with a BAM unit following results of Equivalence Study carried out by DEFRA.
3-2	**Progress Report**	**April 2008**	**February 2009**	**Nitrogen Dioxide** levels due to road traffic sources in Musselburgh and proposed expansions of Musselburgh Racecourse and Wallyford Village continue, and are forecast, to comply with Objectives. Passive monitoring to be introduced in Wallyford. **PM10** levels due to road traffic in Musselburgh complied with using local correction factor but exceeded using national correction factor. TEOM unit replaced with a BAM unit in March 2008 and results from new monitor to be incorporated into Updating and Screening Assessment Report due in April 2009. Sulphur Dioxide **in vicinity of Lafarge Cement works continues to comply with Objectives**

Summary of Previous Review and Assessment Reports				
Round	**Report Type**	**Report Due Date**	**Report Completion Date**	**Conclusions**
4	**Updating & Screening Assessment**	**April 2009**	**November 2009**	**PM10 and Nitrogen Dioxide** levels in Musselburgh will require to be subject of a Detailed Assessment due to the Biomass Unit located at Queen Margaret University. The results of the Updating and Screening Assessment carried out for all other pollutants indicates that current Air Quality Objectives are being complied with.
4-1.1	**Detailed Assessment of Nitrogen Dioxide and PM10 due to QMU Biomass Unit**	**2010**	**October 2010**	**PM10 and Nitrogen Dioxide** levels continue to be met
4-1	**Progress Report**	**April 2010**	**October 2010**	All AQO's being complied with
4-2	**Progress Report**	**April 2011**	**June 2011**	Detailed Assessment of **Nitrogen Dioxide** required for Musselburgh High Street. All other AQO's being complied with.
4-2.1	**Detailed Assessment of Nitrogen Dioxide in Musselburgh due to Road Traffic**	**2012**	**May 2012**	AQMA required for Bridge Street and High Street due to forecast exceedence of Annual Mean AQO if additional monitoring confirms predicted exceedences.
5	**Updating &Screening Assessment**	**April 2012**		AQMA required for Bridge Street and High Street due to forecast exceedence of Annual Mean AQO ***if additional monitoring confirms predicted exceedences in 2012.***
5-1	**Progress Report**	**April 2013**	**August 2013**	AQMA to be declared in Musselburgh in relation to exceedences of NO2 Annual Mean Objective. Further Assessment to be commissioned.
5-1.1	**Further assessment**	**November 2014**	**June 2014**	It is estimated that ambient NOx reductions in the AQMA of between 0% and 27% are required in order to achieve compliance with the annual mean NO2 objective. The source apportionment exercise indicates that emissions from buses form the largest contribution at all locations along the High St AQMA. Modelling of the mitigation scenarios agreed with the Council indicates that an integrated package of interventions would provide the best NOx reductions. Measures that reduce overall traffic, reduce queuing and reduce bus numbers, where appropriate, will reduce road NOx significantly.
5-2	**Progress Report**	**April 2014**	**August 2014**	Monitoring results for 2013, indicate that the current AQMA boundary includes all relevant sources and does not require revocation or amendment at this time. NO_2 levels in AQMA continue to exceed or remain very close to objective.
6-1	**Updating & Screening Assessment**	**April 2015**	**September 2015**	Monitoring results for 2014, indicate that the current AQMA boundary includes all relevant sources and does not require revocation or amendment at this time. NO_2 levels in AQMA continue to exceed or remain very close to objective. Progress is being made wrt development of Action Plan with draft expected early 2016.

Appendix 2: Ratified Data for 2014

Produced by Ricardo-AEA on behalf of the Scottish Government

EAST LOTHIAN MUSSELBURGH N HIGH ST
1st January to 31st December 2014

These data have been fully ratified by Ricardo-AEA

POLLUTANT	PM_{10}+	NO_2	NO_X
99.8th percentile of hourly means		78 µg m^{-3}	296 µg m^{-3}
98.08th percentile of daily means		44 µg m^{-3}	125 µg m^{-3}
Maximum hourly mean	193 µg m-3	105 µg m^{-3}	426 µg m^{-3}
Maximum daily mean	72 µg m-3	56 µg m^{-3}	169 µg m^{-3}
Average	17 µg m-3	23 µg m-3	50 µg m-3
Data capture	92.1%	89.8%	89.8%

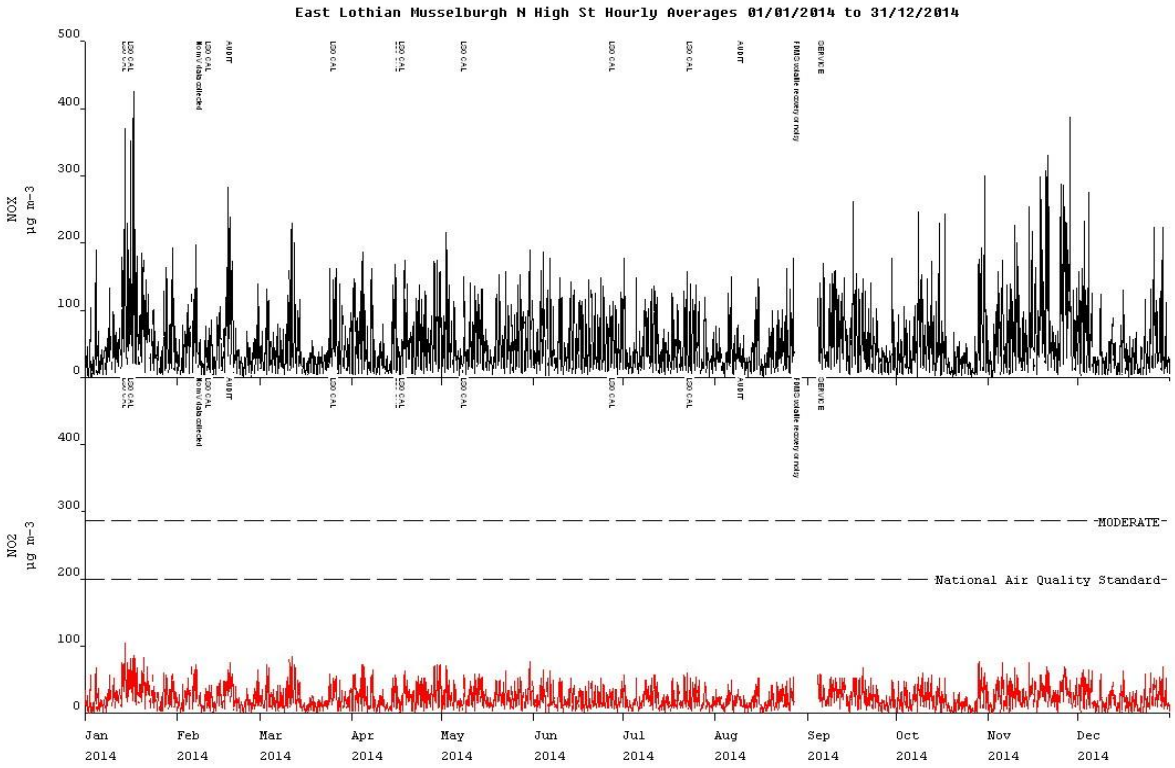
+ PM_{10} instruments:
BAM using a gravimetric factor of 0.83333 for Indicative Gravimetric Equivalent from 1 January 2014.
All gaseous pollutant mass units are at 20°C and 1013 mb. Particulate matter concentrations are reported at ambient temperature and pressure.
NO_X mass units are NO_X as NO_2 µg m^{-3}

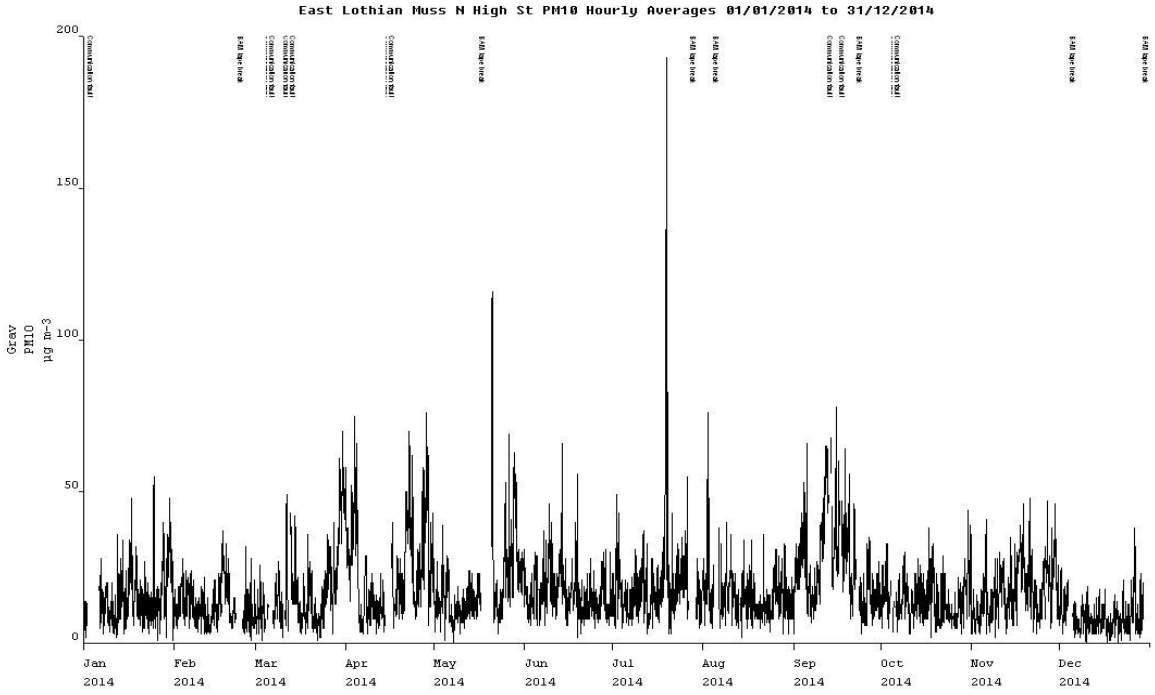
Pollutant	Air Quality Regulations (2000) and Air Quality (Scotland) Amendment Regulations 2002	Exceedences	Days
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	3	3
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 18 µg m^{-3}	0	-
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	0	0

Note: For a strict comparison against the objectives there must be a data capture of >90% throughout the calendar year

Produced by Ricardo-AEA on behalf of the Scottish Government

East Lothian Musselburgh N High St (Combined)
Hourly Mean Data for 1st January to 31st December 2014





Date Created: 10/04/2015

Appendix 3: NO_2 Results and Bias Adjustment Calculation

Nitrogen dioxide Diffusion Tube Results in 2014 (01/01/14 – 31/12/14)

Site ID	Location	2014												AVERAGE	Data Capture %	BIAS ADJUSTED ()
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
1	Musselburgh – Newbigging Junction	46	41	33	32	37	30	27	32	35	29	38	39	35	100	30
4	Musselburgh - 87 High St	33	37	34	25	27	20	18	24	26	32	37	29	29	100	25
6	Musselburgh – 147 High Street	45	34	54	58	65	62	52	48	49	40	51	42	**50**	100	**43**
7	Musselburgh – 183 High St	40	33	49	51	62	47	38	MISSING	46	37	MISSING	35	**44**	83.3	38
8	Musselburgh - Mall Av	38	33	29	30	28	24	18	23	24	25	35	22	27	100	23
9	Musselburgh – 45 Bridge Street	41	34	31	37	40	32	29	27	33	25	45	17	33	100	28
10	Musselburgh – 150 North High St	55	44	43	32	40	28	31	33	35	35	53	35	**39**	100	34
11	Tranent – 89 High St	45	37	35	35	42	34	35	38	38	36	53	32	38	100	33
12	Tranent – 82 High St	23	19	34	34	39	34	25	28	34	23	36	19	29	100	25
13	Tranent – 55 High Street	43	39	23	30	35	33	28	31	34	31	48	27	34	100	29
14	Tranent – 26 High St	38	26	29	33	24	32	22	25	31	23	35	14	**28**	100	24
15	Tranent – 58 Bridge St	28	26	14	19	18	16	17	18	21	19	31	17	20	100	17
16	Haddington - Lyn Lea	14	9	11	7	6	7	5	8	9	8	15	11	9	100	8
23	Musselburgh - 133 N High St	30	25	28	29	28	30	26	24	29	24	38	16	27	100	23
24	Musselburgh - 133 N High St	25	28	8	29	34	31	26	24	27	21	35	22	26	100	22
25	Musselburgh - 133 N High St	33	24	23	25	33	32	26	24	28	22	37	19	27	100	23
26	Wallyford - 116 Salters Rd	29	25	29	25	30	29	29	27	29	23	36	21	28	100	24
27	Wallyford - 71 Salters Rd	36	22	24	27	26	18	22	22	24	25	35	23	25	100	22
*28	Musselburgh - 15 Bridge Street	30	26	31	32	34	40	27	28	32	24	40	17	30	100	26
*29	Musselburgh - 167 High Street	38	27	45	58	60	58	51	48	51	33	47	26	45	100	39
*30	Musselburgh - 137 High Street	39	34	43	43	49	39	36	31	31	29	43	25	37	100	32
*31	Musselburgh - 69 High Street	48	46	51	54	68	56	51	48	54	42	49	40	51	100	**44**
*32	Musselburgh - 86 High Street															

Method	Average for period (µg/m^3)
Analyser	23
Tubes	26.7
BIAS ADJUSTMENT	**0.86**

Appendix 4: Industrial Sources Emissions Data

Lafarge Cement Works

The tables below show the emissions data for Lafarge Cement Works, provided by SEPA.

Emissions from Lafarge Cement Works

Substance	Emission rate (Tonnes per annum)		Change (%)
	2011	2014	
NOx	669	1146	+71
SO_2	590	821	+39
Total Particulates	26	34	+30

Additional Emissions Parameters

Parameter	
Number of stacks (flues in stack)	1 (1)
Stack height	105.5 m
Stack diameter	3 m
Temperature	45-48 ^{o}C
Height of tallest building within 5 stack heights of stacks	45m

NO_2

Tool for Nitrogen Dioxide from stacks > 10m high
TG03 Figure Ref: 6.1

The emissions of NOx in tonnes per annum are calculated for your given stack details that would results in 99.8th percentile of hourly mean ground level NO_2 concentrations less than 40 µg/m^3

Enter required information in Yellow Cells
Resulting Emission in Red Bold

Diameter	3	m
Stack height	105	m
Building height	45	m
99.8 th percentile total oxidant (NO_2+O_3)	155	µg/m^3
Calculated Effective stack height	99.6	m
Maximum Emission Rate	**5972**	tonnes per annum

Note: use acutal emission rates and there is no need to further scale your emission rates

If your actual stack emissions in tonnes per annum are less than the target above you do not need to proceed, if your actual emissions are greater than the target refer to TG03 for further advice

Tool for Nitrogen Dioxide from stacks > 10m high
TG03 Figure Ref: 6.2

The emissions of NOx in tonnes per annum are calculated for your given stack details that would results in a maximum annual mean ground level NO_2 concentrations less than 1 µg/m^3

Enter required information in Yellow Cells
Resulting Emission in Red Bold

Diameter	3	m
Stack height	105	m
Building height	45	m
NO_2 Backgound concentration (include roadside contribution at relevant receptors)	10.36	µg/m^3
Calculated Effective stack height	99.6	m
Maximum Emission Rate	**17699**	tonnes per annum

Note: use acutal emission rates and there is no need to further scale your emission rates

If your actual stack emissions in tonnes per annum are less than the target above you do not need to proceed, if your actual emissions are greater than the target refer to TG03 for further advice

SO_2

Tool for Sulphur Dioxide from stacks > 10m high TG03 Figure Ref: 7.1		
The emissions of SO_2 in tonnes per annum are calculated for your given stack details that would results in 99.9th percentile of 15-minute mean ground level concentrations less than 133 μg/m^3		
Enter required information in Yellow Cells Resulting Emission in Red Bold		
Diameter	3	m
Stack height	105	m
Building height	45	m
Calculated Effective stack height	99.6	m
Maximum Emission Rate	**2646**	tonnes per annum
If your known tonnes per annum are less than that calculated above you do not need to proceed, if your emissions are greater than that calculated refer to TG03 for further advice		

PM_{10}

Tool for PM_{10} from combustion stacks > 10m high TG03 Figure Ref: 8.2		
The emissions of PM_{10} in tonnes per annum from combustion source emissions (>100°C) are calculated for your given stack details that would result in a 90th percentile 24-hour ground level PM_{10} concentrations less than 1 μg/m³		
Enter required information in Yellow Cells Resulting Emission in Red Bold		
Diameter	3	m
Stack height	105	m
Building height	45	m
PM_{10} Backgound concentration (include roadside contribution at relevant receptors)	14.28	μg/m³
Objective year	2004	
Location (UK,London,Scotland)	Scotland	
Calculated Effective stack height	99.6	m
Maximum Emission Rate	**1720.5**	tonnes per annum
If your actual stack emissions in tonnes per annum are less than the target above you do not need to proceed, if your actual emissions are greater than the target refer to TG03 for further advice		

Tool for PM_{10} from low temperture stacks < 100°C and > 10m high TG03 Figure Ref: 8.3		
The emissions of PM_{10} in tonnes per annum from low temperature source emissions (<100°C) are calculated for your given stack details that would result in a 90th percentile 24-hour ground level PM_{10} concentrations less than 1 μg/m³		
Enter required information in Yellow Cells Resulting Emission in Red Bold		
Diameter	3	m
Stack height	105	m
Building height	45	m
PM_{10} Backgound concentration (include roadside contribution at relevant receptors)	14.28	μg/m³
Objective year (2004 or 2010)	2004	
Location (UK,London,Scotland)	Scotland	
Calculated Effective stack height	99.6	m
Maximum Emission Rate	**755.38**	tonnes per annum
If your actual stack emissions in tonnes per annum are less than the target above you do not need to proceed, if your actual emissions are greater than the target refer to TG03 for further advice		

Tool for PM_{10} from combustion stacks > 10m high

TG03 Figure Ref: 8.5

The emissions of PM_{10} in tonnes per annum from combustion source emissions (>100°C) are calculated for your given stack details that would results in a maximum annual mean ground level PM_{10} concentrations less than 1 μg/m³

Enter required information in Yellow Cells
Resulting Emission in Red Bold

Diameter	3	m
Stack height	105	m
Building height	45	m
PM_{10} Backgound concentration (include roadside contribution at relevant receptors)	14.28	μg/m³
Objective year (2010)	2010	
Location (UK,London,Scotland)	Scotland	
Calculated Effective stack height	99.6	m
Maximum Emission Rate	**740.4**	tonnes per annum

If your actual stack emissions in tonnes per annum are less than the target above you do not need to proceed, if your actual emissions are greater than the target refer to TG03 for further advice

Tool for PM_{10} from low temperture stacks < 100°C and > 10m high

TG03 Figure Ref: 8.6

The emissions of PM_{10} in tonnes per annum from low temperature source emissions (<100°C) are calculated for your given stack details that would results in a maximum annual mean ground level PM_{10} concentrations less than 1 μg/m³

Enter required information in Yellow Cells
Resulting Emission in Red Bold

Diameter	3	m
Stack height	105	m
Building height	45	m
PM_{10} Backgound concentration (include roadside contribution at relevant receptors)	14.28	μg/m³
Objective year (2010)	2010	
Location (UK,London,Scotland)	Scotland	
Calculated Effective stack height	99.6	m
Maximum Emission Rate	**325.08**	tonnes per annum

If your actual stack emissions in tonnes per annum are less than the target above you do not need to proceed, if your actual emissions are greater than the target refer to TG03 for further advice